Bacterial community shift revealed Chromatiaceae and Alcaligenaceae as potential bioindicators in the receiving river due to palm oil mill effluent final discharge

ABSTRACT

A thorough outlook on the effect of palm oil mill effluent (POME) final discharge towards bacterial community dynamics in the receiving river is provided in this study by using a high-throughput MiSeq. The shift of bacterial composition could be used to determine the potential bacterial indicators to indicate contamination caused by POME. This study showed that the POME final discharge did not only alter the natural physicochemical properties of the river water but also caused the reduction of bacterial diversity in the receiving river. The Chromatiaceae and Alcaligenaceae which were not detected in the upstream but were detected in the downstream part of the river are proposed as the indicator bacteria to indicate the river water contamination caused by POME final discharge. The emergence of either one or both bacteria in the downstream part of the river were shown to be carried over by the effluent. Therefore, an accurate pollution monitoring approach using bacterial indicator is expected to complement the conventional POME pollution assessment method which is currently dependent on the physicochemical properties of the final discharge. This is the first study that reported on the potential indicator bacteria for the assessment of river water contamination caused by POME final discharge.